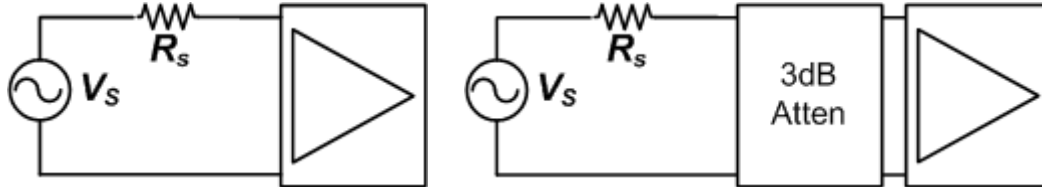
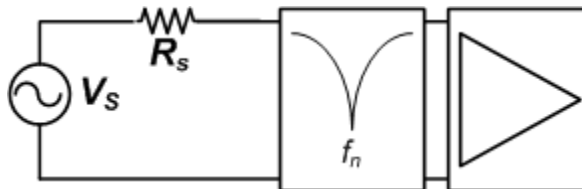


Electronic Circuits & Systems (ECE166/265A) – ECE MS Comp Exam, Fall 2013

- 1) Consider the amplifier shown below to the left. The amplifier has a noise figure of 3 dB and an IIP3 of 10 dBm and operates at room temperature. Assume that IIP2 is infinity.



- If source temperature is 273K, how much noise power is available at the input of the amplifier if the amplifier bandwidth is 1 MHz? (5)
- What is the SFDR of the amplifier shown on the left? (4)
- A 3-dB attenuator is placed between the source and the amplifier as shown in the right. What is the noise figure of the cascade of the attenuator and amplifier? (6)
- What is the IIP3 of the combination of the attenuator and amplifier? (8)
- What is the SFDR of the new combination? Has it improved over the first case? (4)
- If the input frequency is 1 GHz and a jammer is located at 1.2 GHz, at what frequency are the intermodulation products located? (4)
- Instead of an attenuator, you are presented with the notch filter shown below. The notch is located at 1.2 GHz with rejection of 20 dB. The filter provides no attenuation at 1 GHz. How much is the IM3 product at 800 MHz reduced. (5)



- What is the SFDR of the receiver with the notch? (4)